The Design of the Low-Earth Orbit Flight Test of an Inflatable Decelerator (LOFTID) Reentry Vehicle (RV)

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NASA

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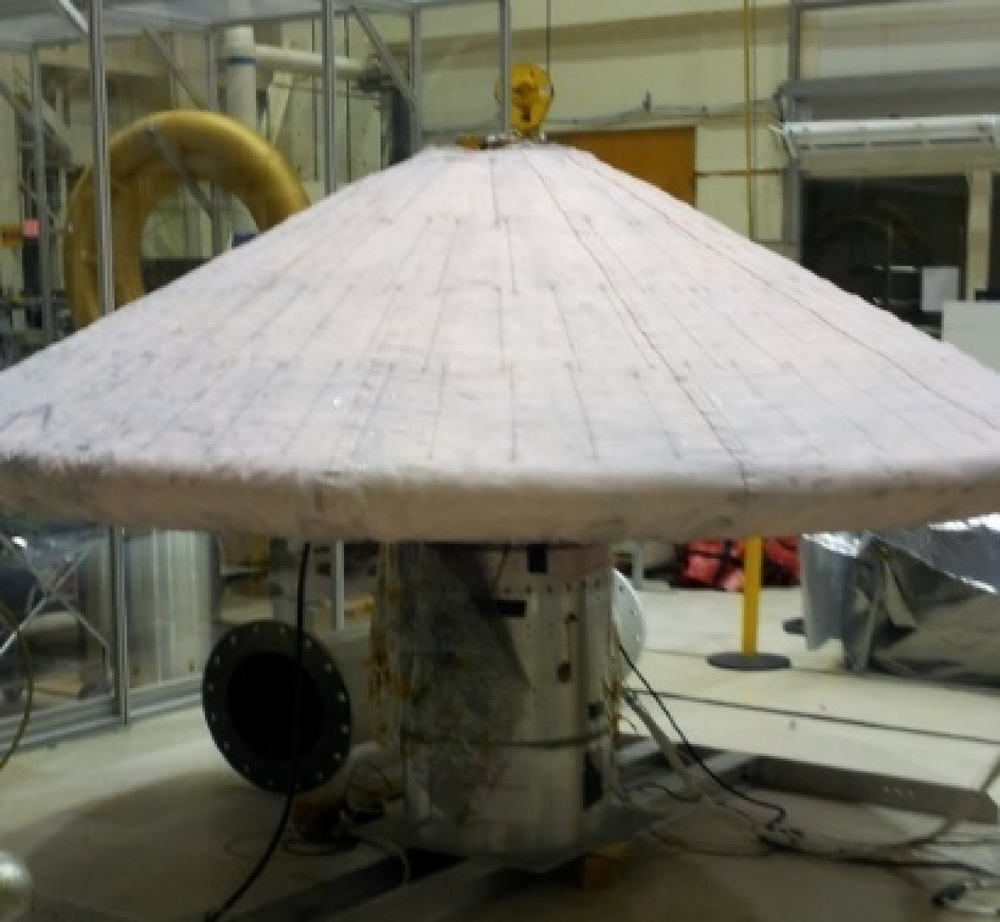
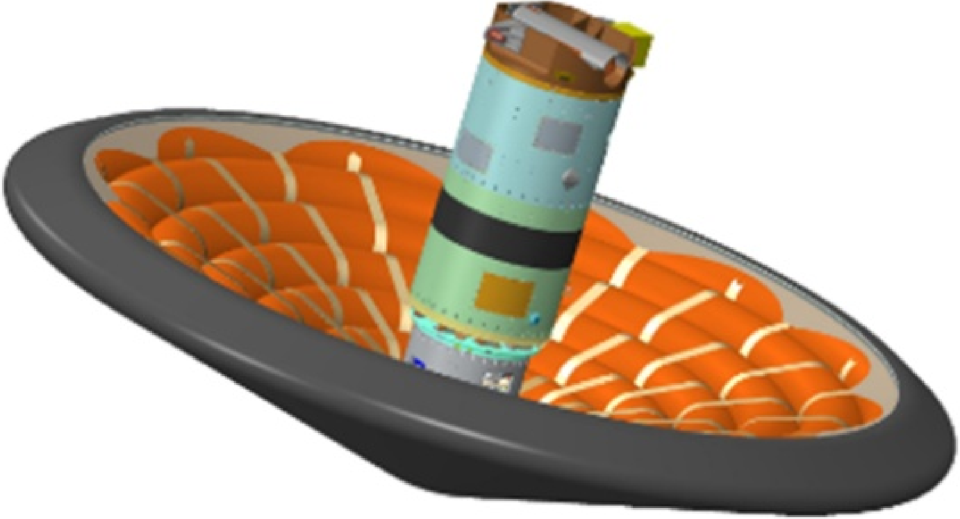
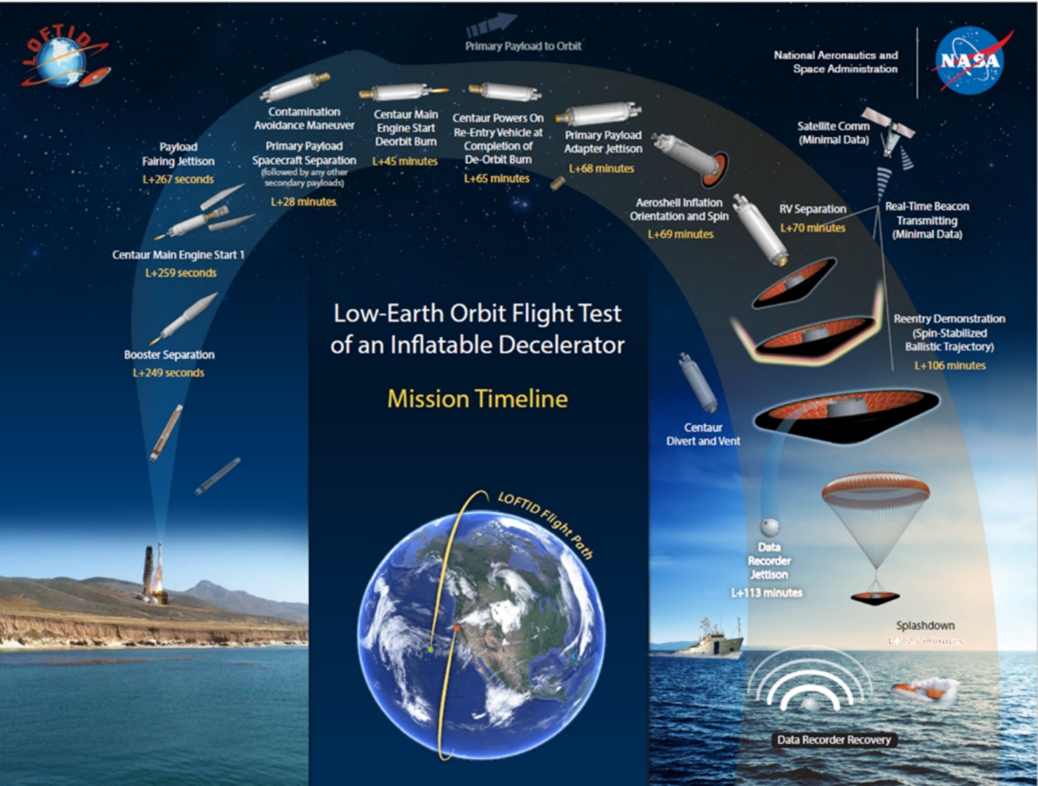




National Aeronautics and Space Administration

Low-Earth Orbit Flight Test of an Inflatable Decelerator

Mission Timeline



Booster Separation
L+249 seconds

Centaur Main Engine Start 1
L+259 seconds

Payload Fairing Jettison
L+267 seconds

Primary Payload Spacecraft Separation
(followed by any other secondary payloads)
L+28 minutes

Contamination Avoidance Maneuver

Primary Payload to Orbit

Centaur Main Engine Start Deorbit Burn
L+45 minutes

Centaur Powers On Re-Entry Vehicle at Completion of De-Orbit Burn
L+65 minutes

Primary Payload Adapter Jettison
L+68 minutes

Aeroshell Inflation Orientation and Spin
L+69 minutes

RV Separation
L+70 minutes

Satellite Comm
(Minimal Data)

Real-Time Beacon Transmitting
(Minimal Data)

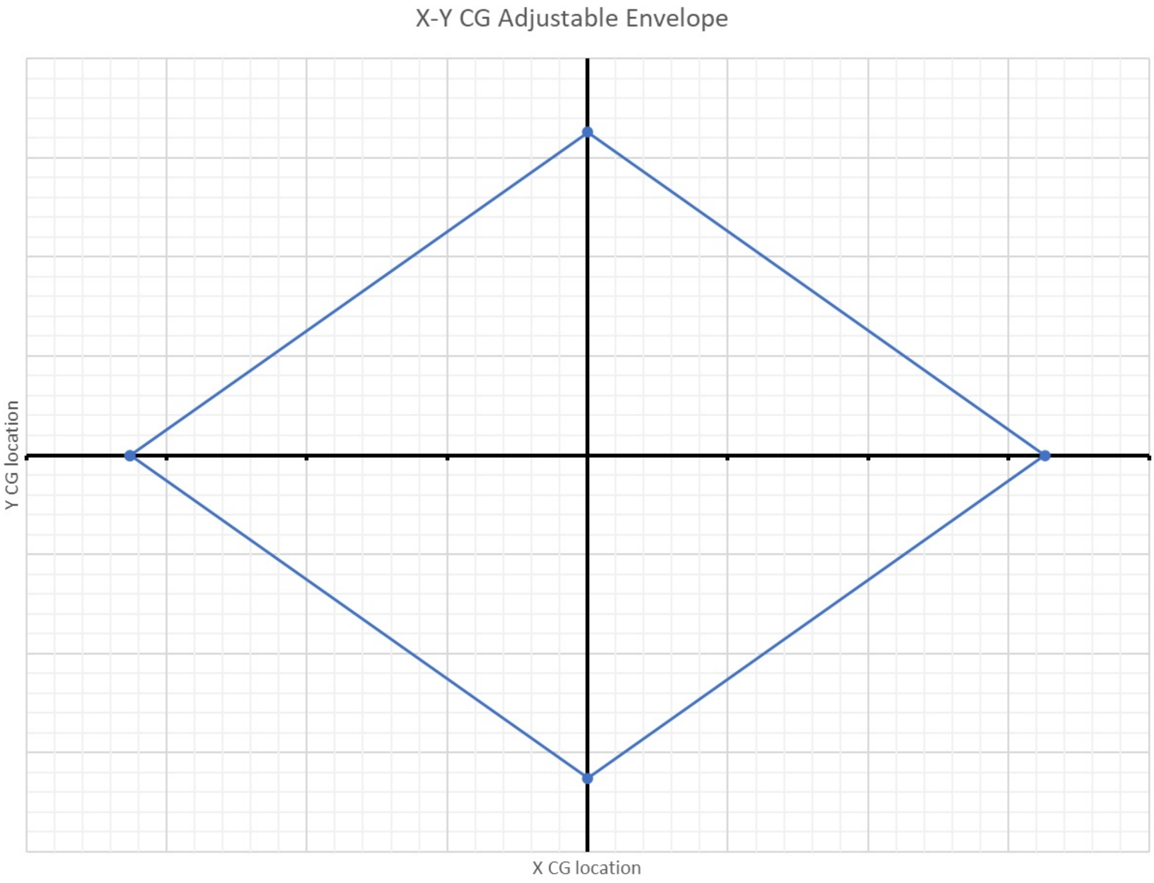
Reentry Demonstration
(Spin-Stabilized Ballistic Trajectory)
L+106 minutes

Centaur Divert and Vent

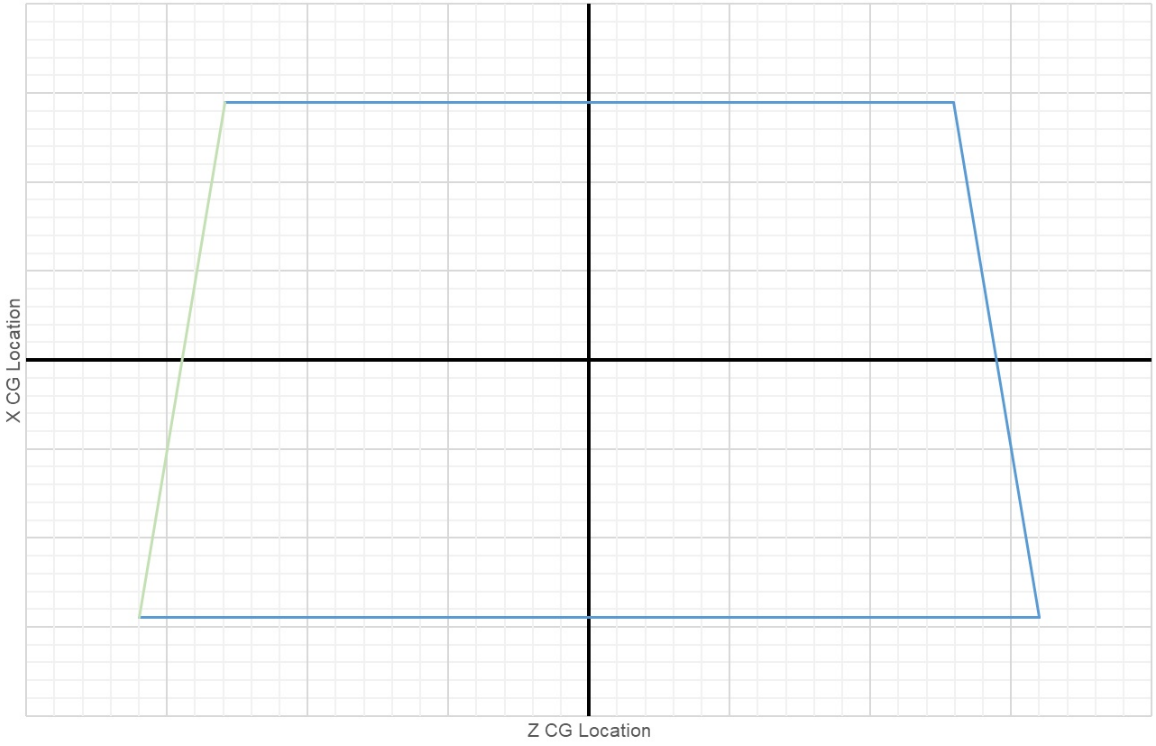
Data Recorder Jettison
L+113 minutes

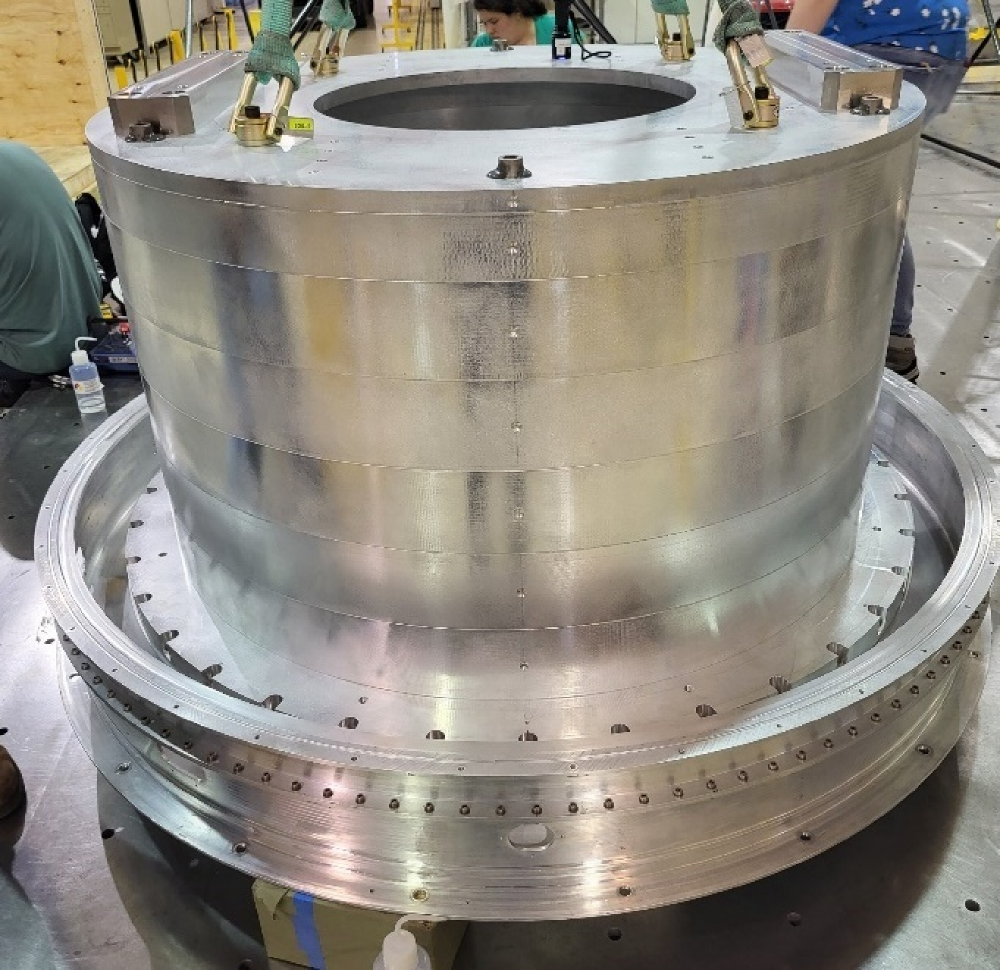
Splashdown
L+125 minutes

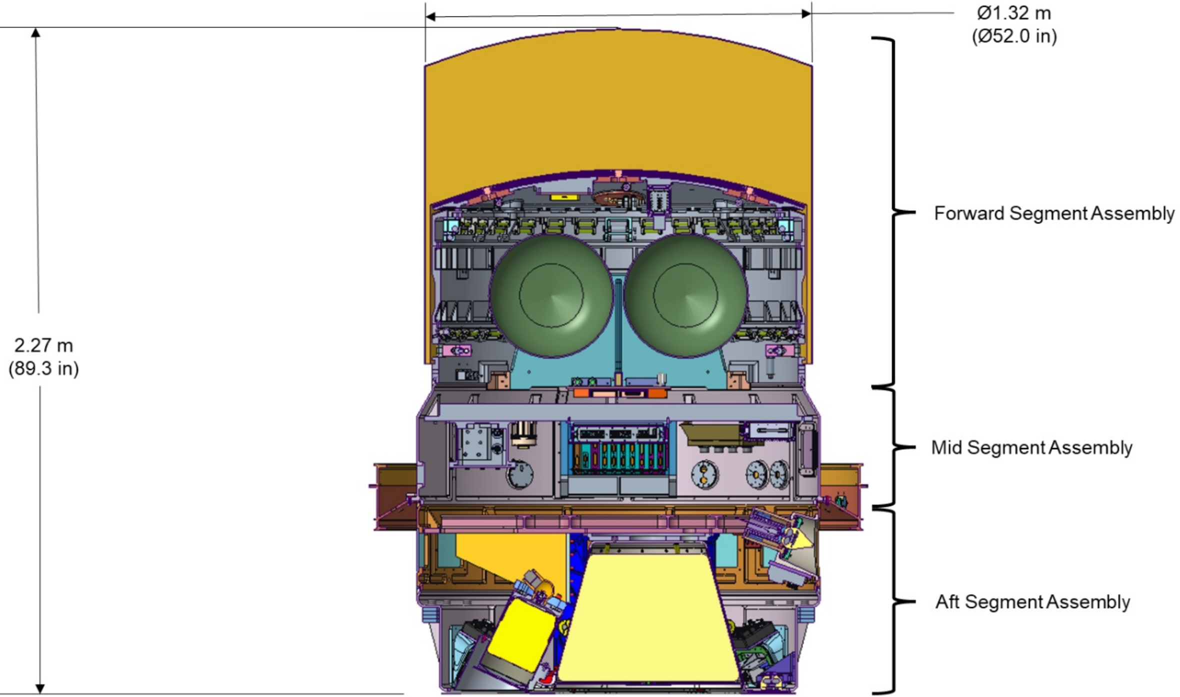
Data Recorder Recovery

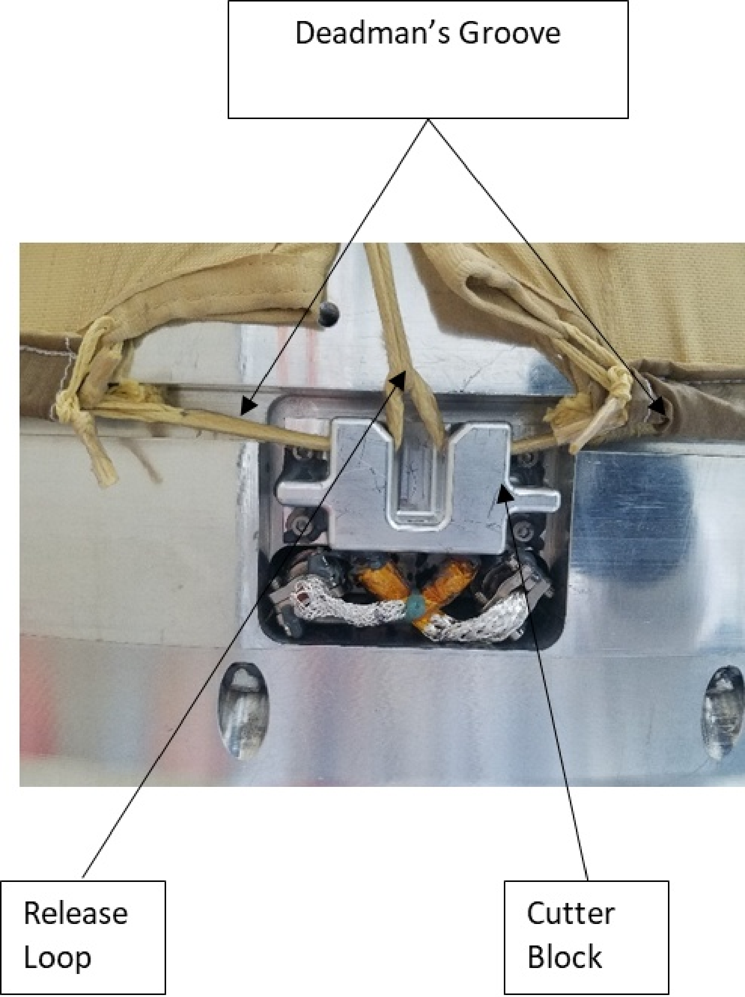

X-Y CG Adjustable Envelope
Y CG location
X CG location

X-Z CG Adjustable Envelope

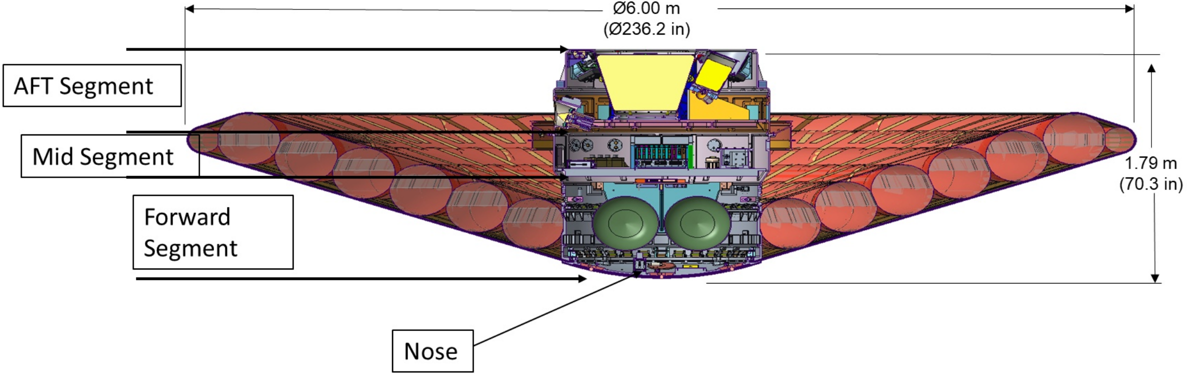


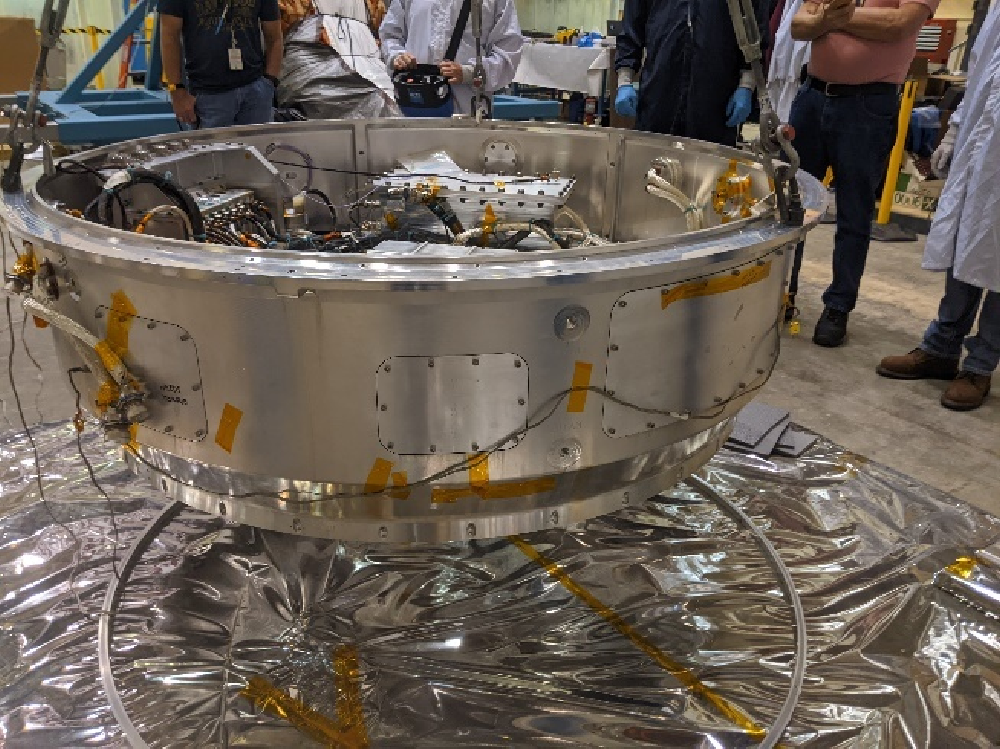


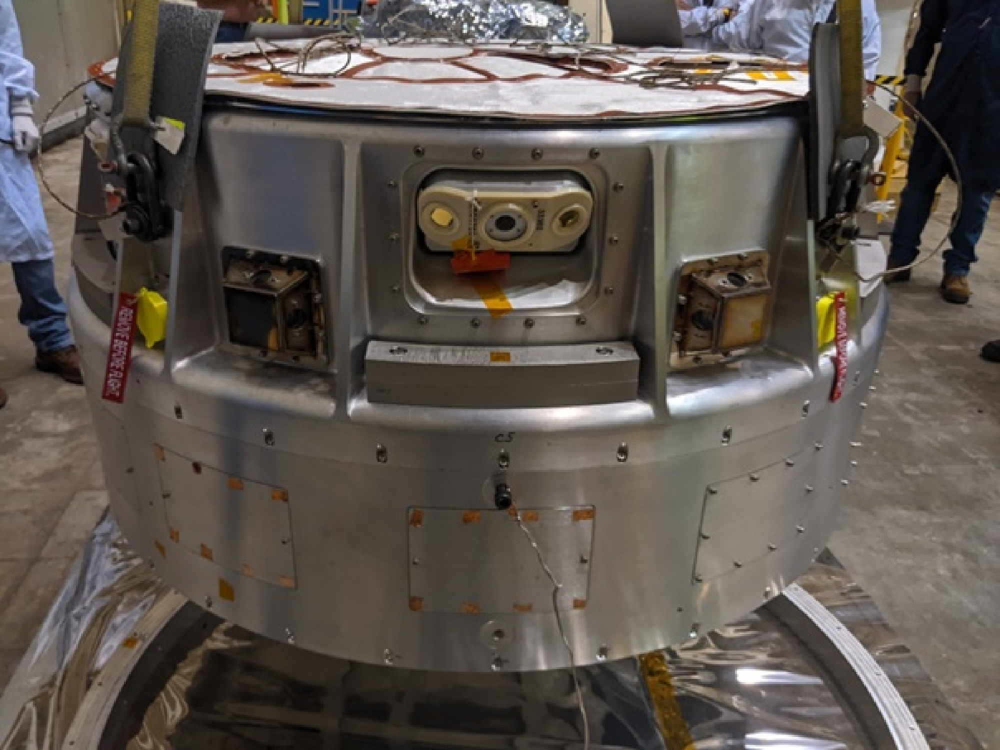

Ø1.32 m
(Ø52.0 in)
2.27 m
(89.3 in)
Forward Segment Assembly
Mid Segment Assembly
Aft Segment Assembly

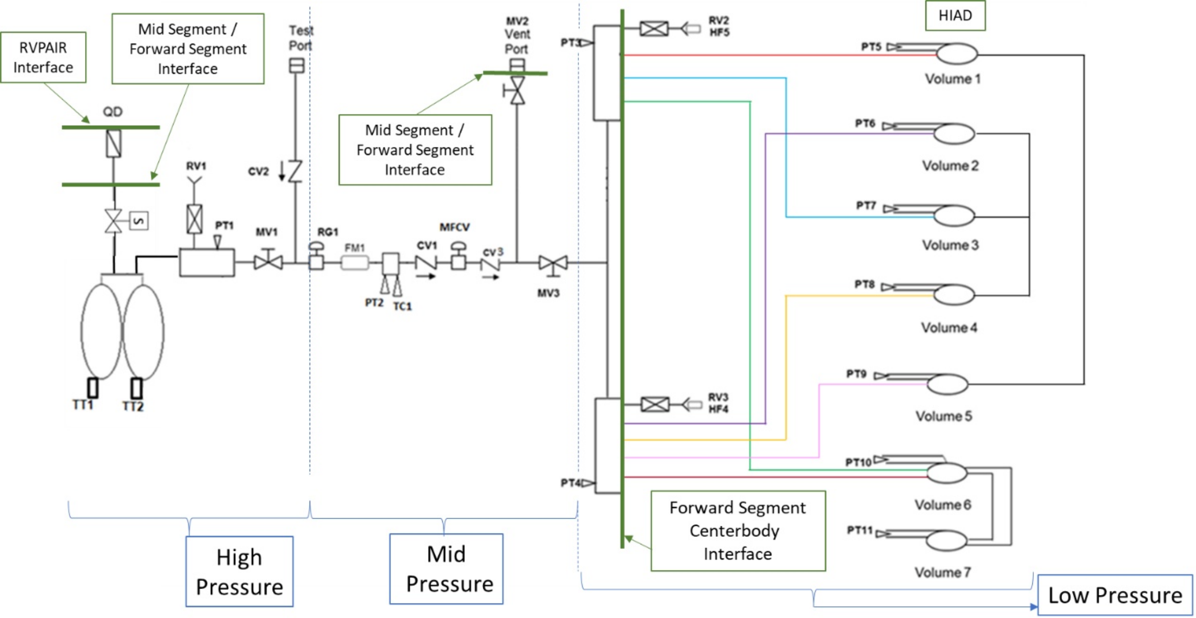


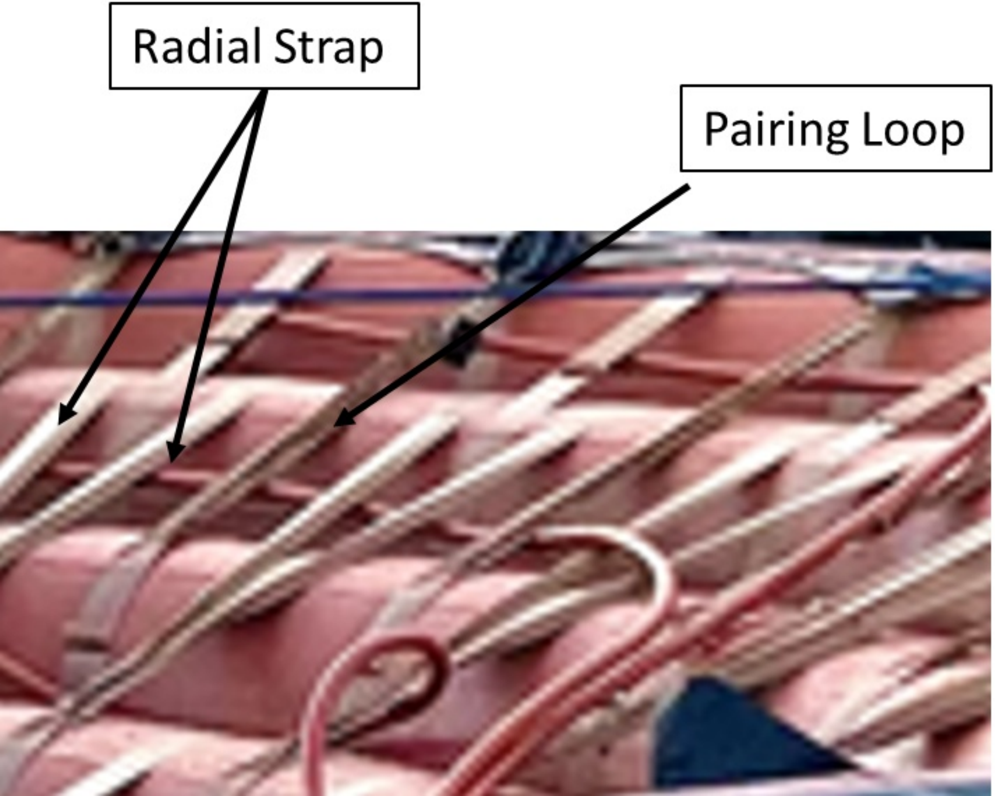
Deadman's Groove
Release Loop
Cutter Block

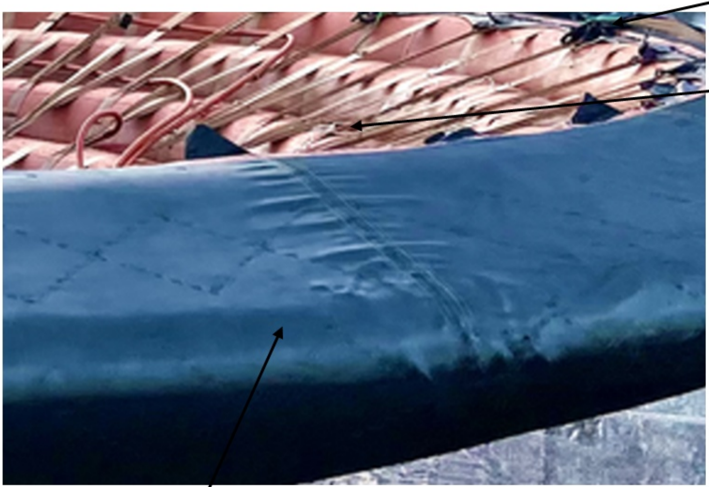

Ø6.00 m
(Ø236.2 in)
AFT Segment
Mid Segment
Forward Segment
1.79 m
(70.3 in)
Nose




REMOVE BEFORE FLIGHT
C5


RVPAIR Interface
Mid Segment / Forward Segment Interface
Test Port
MV2 Vent Port
PT3
RV2 HF5
HIAD
PT5
Volume 1
QD
Mid Segment / Forward Segment Interface
PT6
Volume 2
RV1
CV2
PT7
Volume 3
PT1
MV1
RG1
FM1
MFCV
CV1
CV3
MV3
PT2
TC1
PT8
Volume 4
PT9
Volume 5
TT1
TT2
RV3 HF4
PT10
PT4
Volume 6
Forward Segment Centerbody Interface
PT11
Volume 7
High Pressure
Mid Pressure
Low Pressure

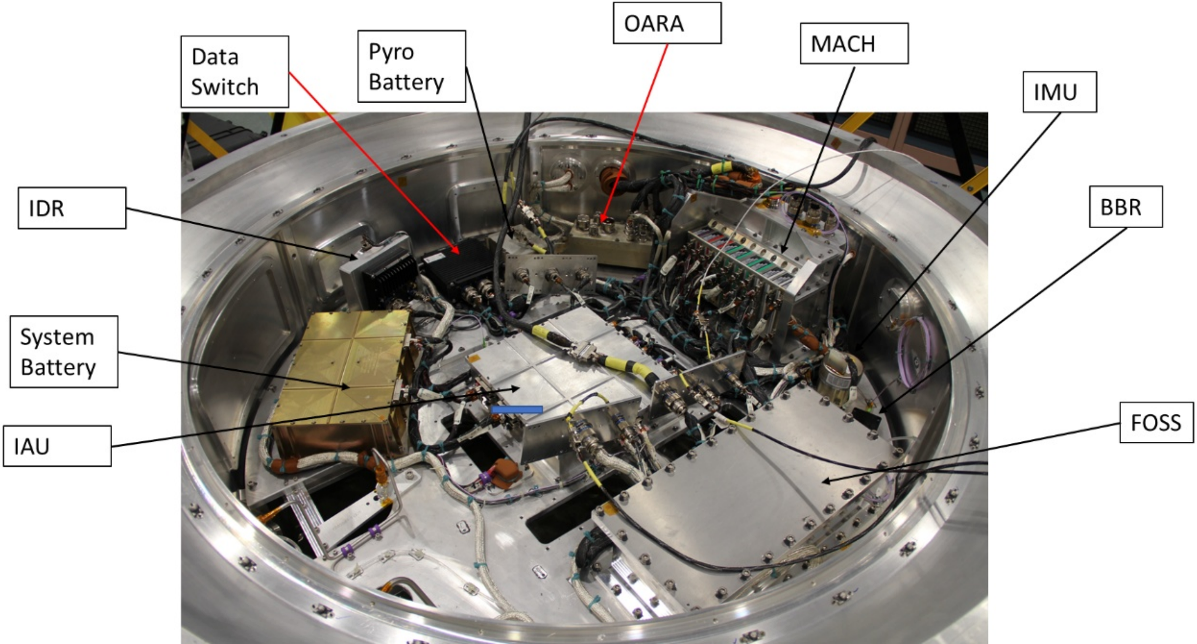

Radial Strap
Pairing Loop

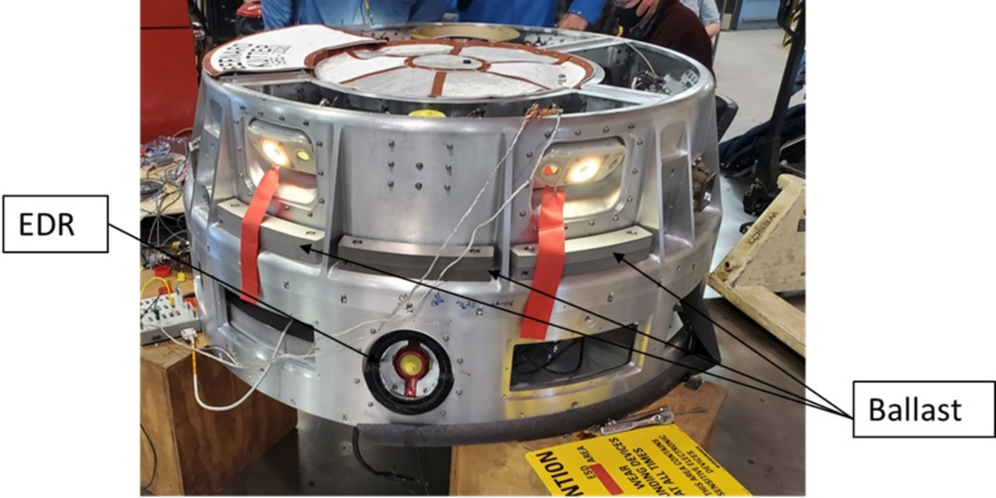


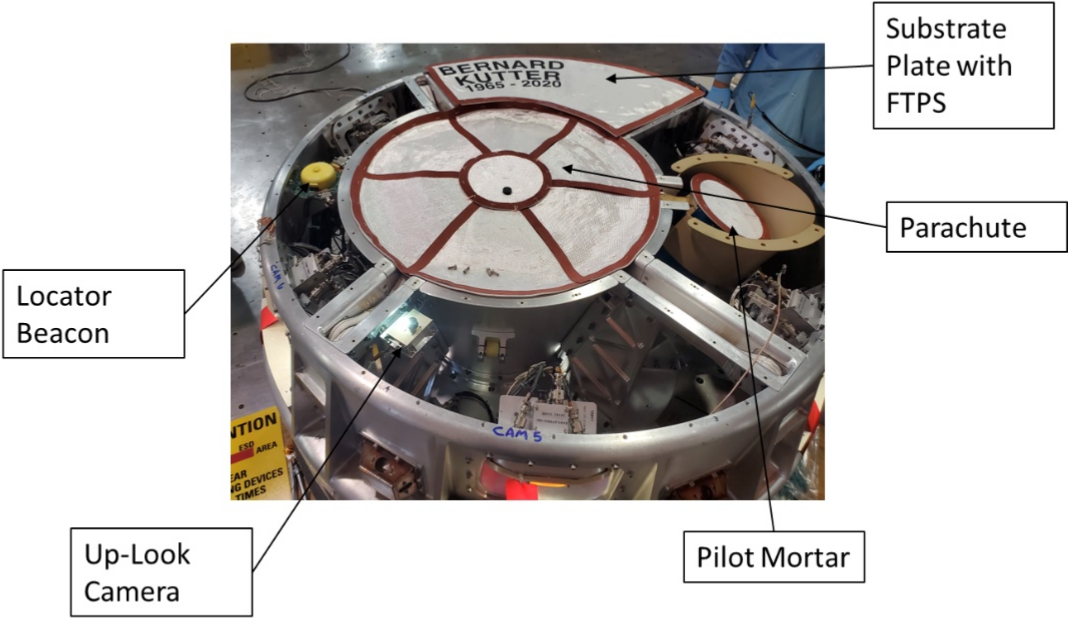
FTPS Cord Loop

FTPS Anchoring Becket

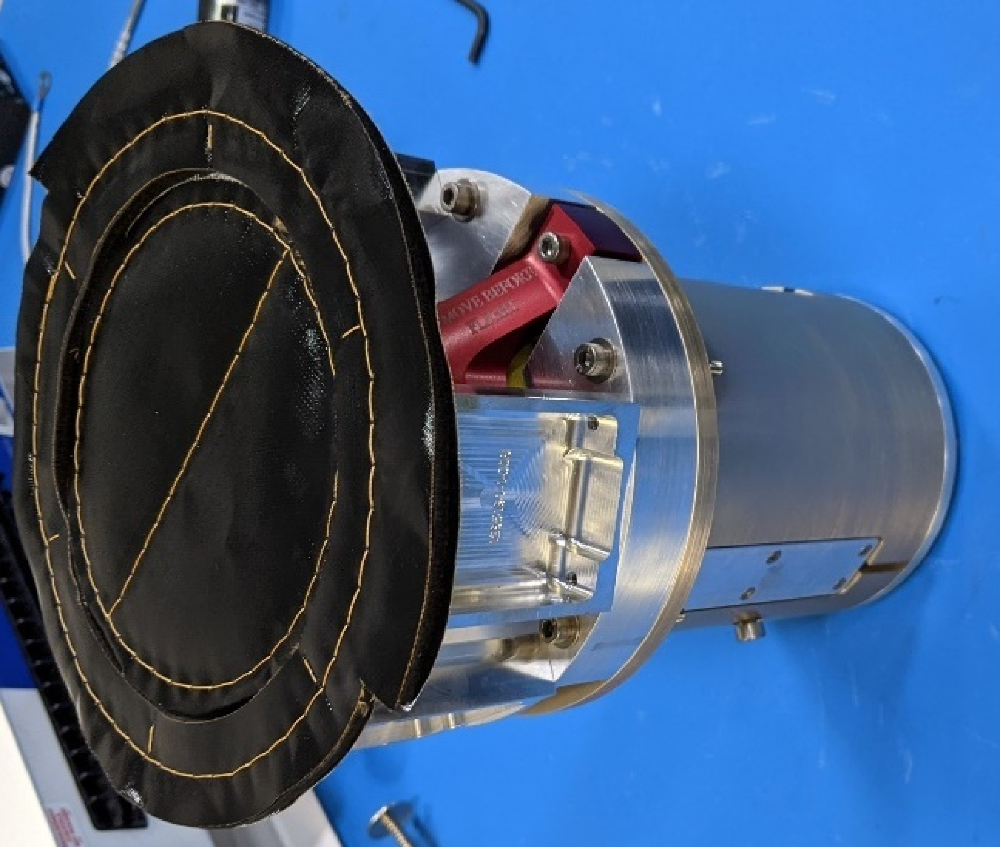
FTPS Outer Silicon Carbide layer

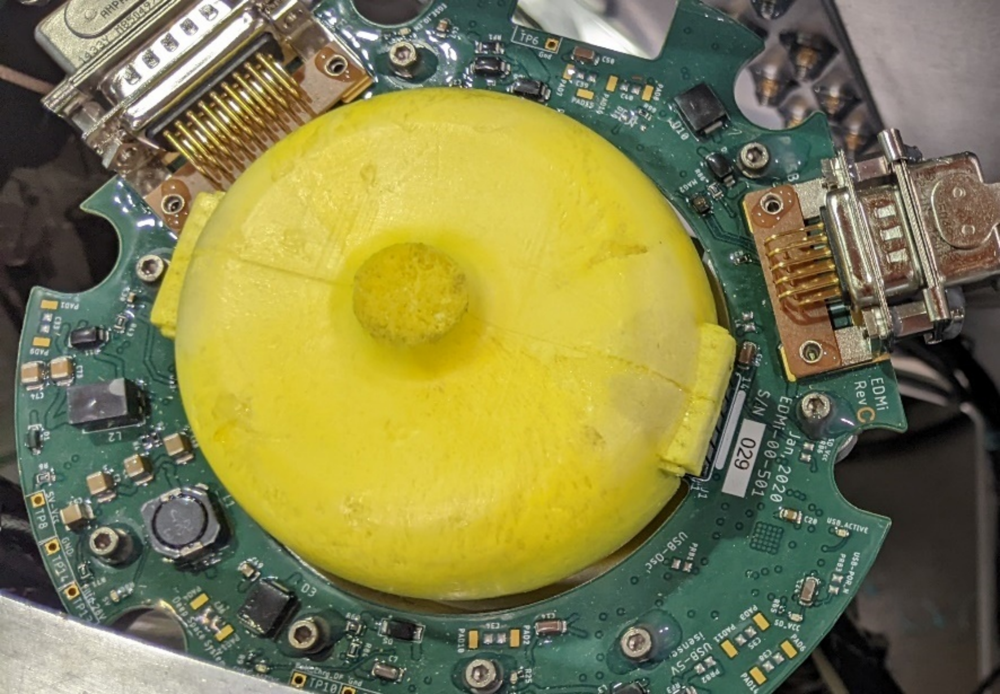

Data Switch
Pyro Battery
OARA
MACH
IMU
IDR
BBR
System Battery
IAU
FOSS


EDR
Ballast

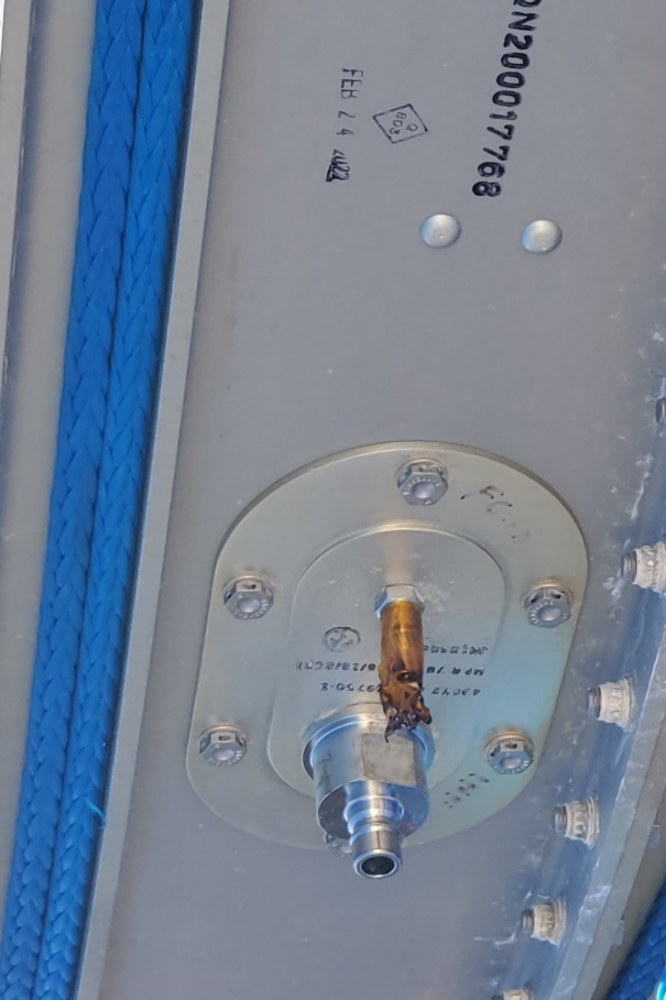
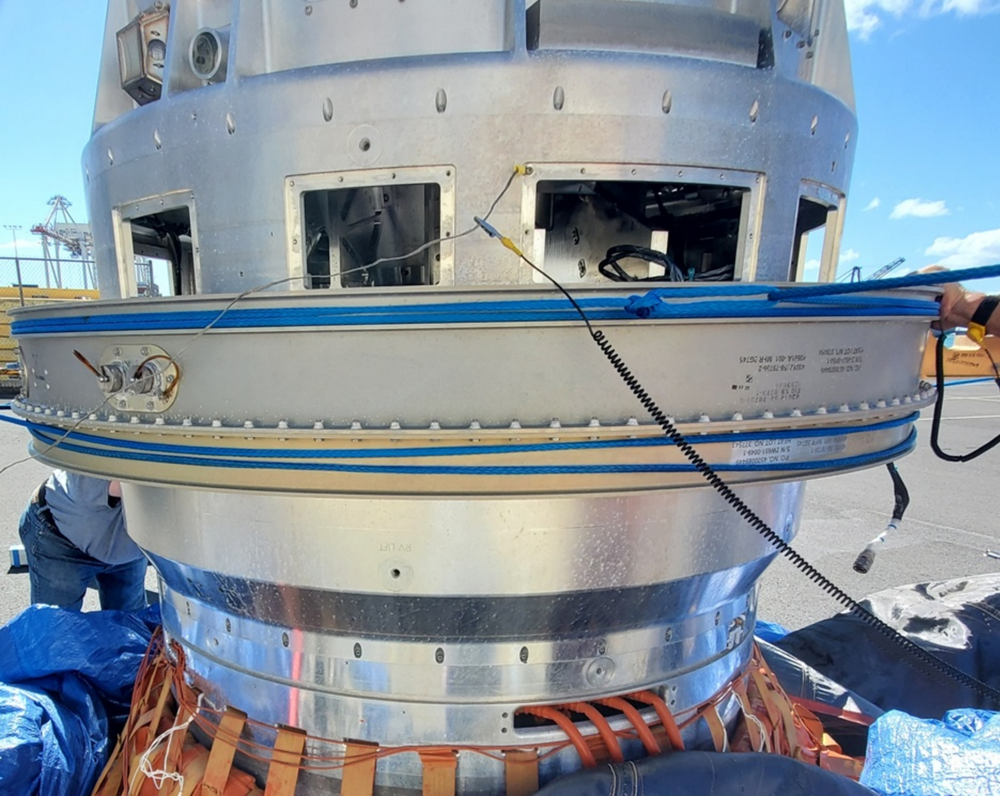

Substrate Plate with FTPS
BERNARD KUTTER
1965 - 2020
Parachute
Locator Beacon
CAM 6
CAM 5
Up-Look Camera
Pilot Mortar

1262
1262
DANGER


MOVE BEFORE
FLIGHT


TP6
Gnd
EDMi
Rev C
S/N
029
EDMi-00-501
Jan 2020
USB-Osc
USB_ACTIVE
USB-POR_N
SD_VCC
USB-5V
isense
Deep Space Systems
TP8
5V-VCC
GND
TP14
TP10
Gnd
L1
L2
D3
C28
PAD1
PAD9

2555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